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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/869,123
Filing Date: October 03, 2001
Appellant(s): REIHS ET AL.

J. Derek Mason
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 31 January 2005.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1-10, 27-28, and 52-54 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5,674,592	CLARK et al.	10-1997
5,624,632	BAUMANN et al.	4-1997
6,124,039	GOETZ et al.	9-2000
EP 825241 A1	TAKAHASHI et al.	2-1998

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-6, 8-10, 28, and 52-53 are rejected under 35 U.S.C. 102(b) as being anticipated by Clark et al.

Clark et al. discloses functionalized films that give ultraphobic properties to a substrate. The substrate is a metal (column 6, lines 15-17) or a polyimide (example 1), (claims 5-6 and 8-9) and the coated substrate demonstrates ultraphobic behavior, with contact angles on the order of 171° (column 6, lines 48-52), meeting this part of claims

3 and 4. Further, the surfaces are such that water rolls of at the "slightest inclination of the substrate" (column 6, lines 52-53). The examiner assumes that the term "slightest inclination" in Clark et al. is less than 10°, thereby meeting this aspect of claim 3. The surface in Clark et al. is coated with a Langmuir-Blodgett film that gives it ultraphobic properties.

Langmuir-Blodgett films are inherently amphoteric and also meet the definition of "hydrophobic phobicization auxiliary." As such, Clark et al. also fulfills claims 10 and 28.

Clark et al. does not specify the value of S as the applicant does in claims 1 and 2. However, the applicant has not shown that the value of S is independent of the contact angle of the substrate. It appears from the current application, see table 1, that any ultraphobic surface having a contact angle above 150° would inherently have a surface topography with the value of S in claims 1 and 2. Therefore the examiner deems that the structure in Clark et al. meets the S value requirement of claims 1 and 2.

Regarding newly added claims 52 and 53, Clark et al. discloses a surface that may be either hydrophobic or oleophobic (column 2, lines 43-44 and column 7, lines 12-17), meeting that aspect of these claims.

Claims 1-5, 8, 27, and 52 are rejected under 35 U.S.C. 102(b) as being anticipated by Takahashi et al.

Takahashi et al. discloses a water repellent coating composition. It teaches that the coating composition yields contact angles up to 156° (example 1, meeting the applicant's claims 3 and 4) and that the substrate can be polyurethane (claims 5 and 9

in Takahashi et al. meeting the applicant's claims 5, 8, and 27). Takahashi et al. does not specify the value of S as the applicant does in claims 1 and 2. However, the applicant has not shown that the value of S is independent of the contact angle of the substrate.

It appears from the current application, see table 1, that any ultraphobic surface having a contact angle above 150° would inherently have a surface topography with the value of S in claims 1 and 2. Therefore the examiner deems that the structure in Takahashi et al. meets the S value requirement of claims 1 and 2.

Takahashi et al. also does not disclose a roll-off angle, as the applicant does in claim 3. The examiner's position is that since the contact angle in Takahashi et al. is the same as the contact angle in claims 3 and 4 and since the surface in Takahashi et al. is designed to be water repellant, the surface in Takahashi et al. will inherently possess the roll-off angle that the applicant claims in claim 3.

Regarding newly added claim 52, Takahashi et al. discloses a surface that is hydrophobic, meeting that aspect of the claim.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Clark et al. in view of Baumann et al.

Clark et al. is applied to claim 6 as discussed above, but does not explicitly state that the metal that is used can be an aluminum-magnesium alloy. Baumann et al. discloses an aluminum-magnesium alloy useful in the preparation of airplane fuselage surfaces (column 1, lines 45-46).

It is well known in the art that it is advantageous to have an ultraphobic surface coated on an airplane fuselage in order to prevent ice from forming on the fuselage in cold weather.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the coating in Clark et al. on the aluminum-magnesium substrate in Baumann et al. The motivation for doing so would be to provide an airplane fuselage surface that resists ice formation.

Therefore it would have been obvious to combine Baumann et al. with Clark et al. to obtain the invention as specified in claim 7.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. in view of Baumann et al.

Takahashi et al. is applied to claim 1 as discussed above, and shows that the water resistant coating can be used on airplane fuselages (figure 17), but does not disclose the exact metal from which the fuselage is made. Baumann et al. discloses an aluminum-magnesium alloy useful in the preparation of airplane fuselage surfaces (column 1, lines 45-46). It is well known in the ad that it is advantageous to have an ultraphobic surface coated on an airplane fuselage in order to prevent ice from forming on the fuselage in cold weather. At the time of the invention, it would have been obvious to a person of ordinary skill in the ad to use the coating in Takahashi et al. on the aluminum-magnesium substrate in Baumann et al. The motivation for doing so would be to provide an airplane fuselage surface that resists ice formation. Therefore it would

have been obvious to combine Baumann et al. with Takahashi et al. to obtain the invention as specified in claims 6 and 7.

Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Clark et al. in view of Goetz et al.

Clark et al. discloses a surface that meets the requirements of claim 1, but does not include a substrate made from $AlMg_3$. Goetz et al. discloses a substrate made from $AlMg_3$ used in solar cells. Since it is useful for solar cells to have hydrophobic or oleophobic surfaces in order to keep them clean during use, it would have been obvious to coat the substrate in Goetz et al. with the coating in Clark et al.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to coat the substrate in Goetz et al. with the coating in Clark et al. The motivation for doing so would be to obtain a substrate (or solar cell) with hydrophobic or oleophobic surface properties. Therefore it would have been obvious to combine Goetz et al. with Clark et al. to obtain the invention as specified in claim 54.

Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. in view of Goetz et al.

Takahashi et al. discloses a surface that meets the requirements of claim 1, but does not include a substrate made from $AlMg_3$. Goetz et al. discloses a substrate made from $AlMg_3$ used in solar cells. Since it is useful for solar cells to have hydrophobic

surfaces in order to keep them clean during use, it would have been obvious to coat the substrate in Goetz et al. with the coating in Takahashi et al.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to coat the substrate in Goetz et al. with the coating in Takahashi et al. The motivation for doing so would be to obtain a substrate (or solar cell) with hydrophobic surface properties. Therefore it would have been obvious to combine Goetz et al. with Takahashi et al. to obtain the invention as specified in claim 54.

Claims 1-10, 27-28, and 52-54 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the product made in the examples in the specification, does not reasonably provide enablement for any and every surface having the claimed properties. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims without undue experimentation.

Specifically, the claim currently covers all surfaces with the claimed properties. However, the specification does not enable one skilled in the art to make a surface with the claimed properties without using the exact methods or materials found in the examples. The full range of methods or materials that the claim covers is therefore not disclosed by the specification and one skilled in the art would require undue experimentation to discover the full scope of the applicant's invention. The prior art does not specifically describe the claimed surface topography properties or how to obtain them, and one of ordinary skill in the art would not recognize methods of forming

such surfaces without using the exact examples from the present specification. Due to the unpredictable nature of the art, it would not be apparent that simple modifications of the working examples would yield surfaces of the claimed surface topography. Thus, one skilled in the art considering the present specification would not know how to obtain the claimed surfaces beyond those specific examples.

(11) Response to Argument

The Appellant argues that the declaration provided shows that surfaces having the claimed contact angle do not necessarily possess the claimed S integral value. The Appellant argues that this negates the position that the S integral value would be inherent to a material having the claimed contact angle.

1. However, the Appellant appears to have shown only ***estimated*** values for the prior art. A theoretical result does not substitute for factual, measured results. In this case, it appears that three of the substrate surface dimensions of a few examples of the prior art have been used to generate a number of data points, which were then used to calculate a value for the S integral. First, it is unclear how three dimensions can generate a number of data points with certainty. Although the Appellant argues that 262,144 data points have been used to obtain the integral data, it is unclear how this number of data points can be estimated using only three *averages*. The Appellants have access to actual topography data points for the calculations of the working examples as opposed to the averages provided by the reference. Secondly, it is noted that the dimensions used are taken from the unfinished surface. The examples of the

Clark reference discuss properties of the nanostructure film, which is then coated with a monolayer of $C_8F_{17}(CH_2)_{11}SH$. The contact angles are measured from this coated surface, although the data relied upon by the applicant appears to represent an uncoated surface.

2. In response to the Appellant's argument that the declaration supports the accuracy of the calculations, it is first noted that the Appellant's allegations of accuracy do not constitute proof of such a statement. The Appellant has not provided support to show the accuracy of such calculations. Furthermore, it is noted that this statement refers to the accuracy that can be obtained from the number of data points. However, it appears that these data points have been generated from only three dimensions. The examiner questions the accuracy of the generated data points. Also, it is noted that these data points are generated from the substrate dimensions *but not from the coated substrate dimensions*. The Appellant further theorizes the affects of this coating on the modeled surface. The Appellant has not shown proof of accuracy of the calculated values.

Regarding the Appellant's arguments that the examples and specification show various methods of achieving the invention, it is the examiner's position that, although one of ordinary skill in the art may have the ability to duplicate the Appellant's examples, undue experimentation would be needed to achieve the Appellant's properties otherwise. In other words, the specification and examples do not guide one of ordinary skill in the art to specific ways of achieving the properties but rather focus on a great number materials and methods that *may be used or combined* to achieve the claimed

properties. The specification also focuses on the methods of measuring or calculating the claimed properties. However, this does not enable one of ordinary skill in the art to experiment within the teachings of the specification with sufficient certainty of achieving the desired results. Although a number of materials and surface modification methods have been discussed, the specific steps or combinations of materials that are used to achieve the claimed properties are not discussed.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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mdb
May 11, 2005

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